

**M. SC. (ANALYTICAL CHEMISTRY) SEM-IV (CHOICE BASED
CREDIT & GRADE SYSTEM) : SUMMER - 2018
SUBJECT: ELECTIVE: ENVIRONMENTAL ANALYSIS**

Day: **Friday**
Date: **27/04/2018**

S-2018-0888

Time: **03.00 PM TO 06.00 PM**
Max. Marks: 60

N.B.:

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Answers to both the sections should be written in **SEPARATE** answer book.

SECTION-I

Q.1 Attempt any **THREE** of the following: **(15)**

- a) Explain two parameters to determine the quality of drinking water.
- b) What are aims and objectives of industrial waste water treatment?
- c) Explain 'Ultra filtration' technique used in industrial waste water treatment.
- d) Write a note on principles of green chemistry.
- e) Describe variety of ion- exchange resins used in effluent treatment.

Q.2 Attempt any **THREE** of the following: **(15)**

- a) Give a brief account of primary, secondary and tertiary treatment used in waste water treatment.
- b) Explain how 'Ion- exchange' techniques is used in recovering chromate from effluent of electro plating industry.
- c) 'Water is the Universal Solvent'. Explain.
- d) How atom economy is defined? In what sense it is a key aspect of the practice of green chemistry.
- e) Write a note on toxicity of metals.

SECTION-II

Q.3 Attempt any **THREE** of the following: **(15)**

- a) Explain the role of chlorine used in treating waste water.
- b) How the synthetic dyes are classified? How do they cause water pollution?
- c) Define green chemistry. Why green chemistry is needed?
- d) What is adsorption capacity of carbon? How it is characterized?
- e) Discuss the 'Trickling filtration' used for treatment of waste water.

Q.4 Attempt any **THREE** of the following: **(15)**

- a) What are the raw materials commonly used in most of the electroplating industries? What are the by -products and their role in process selection?
- b) How heavy metals are restored in electro-plating industries?
- c) Describe the process of 'Coagulation' used in industries to achieve optimum coagulation.
- d) Explain how the biological treatment is employed in treating effluent from dye industry.
- e) With the help of flow sheet diagram explain the techniques for toxicity identification of industrial waste water.

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